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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/579,201	05/12/2006	Chris Udo Maeding	P29504	8924

7055 7590 04/19/2010

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EXAMINER	
NGUYEN, ANDREW H	
ART UNIT	PAPER NUMBER
3741	

NOTIFICATION DATE	DELIVERY MODE
04/19/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/579,201	MAEDING, CHRIS UDO	
	Examiner	Art Unit	
	ANDREW NGUYEN	3741	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 January 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *12-34* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *12-34* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 33-34 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The phrase “in combination with a combustion chamber” is unclear. It is unclear if Applicant is claiming a combustion chamber including the injector (if so, it should be amended to "A combustion chamber with the injection element of claim 12 ..."). As it stands, only an injector is actually claimed.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 12-16, 19, 21-22, 25, 27, and 33-34 are rejected under 35 U.S.C. 102(b) as being anticipated by US 3,498,059 (Gradon)

<u>Regarding claim 12:</u>

Gradon teaches:

An injection element, comprising: an inner element with a first outlet opening (Fig 2; element 33 with opening 36)*; an outer element* (element 56)*, comprising: at least one second outlet opening structured and arranged for receiving and injecting fuel in a combustion space, and arranged coaxially to the first outlet opening* (56 has an annular opening 40 coaxial with element 33 and receives fuel from fuel conduit 46; injects fuel into combustion space)*; and third outlet openings radially beyond the at least one second outlet opening composed of bores structured and arranged for forming a cooling liquid film layer, wherein the bores are arranged along a ring, which is coaxial to the first outlet opening and the at least one second outlet opening* (Fig 2; bores 64 are arranged in a ring around element 56, which is coaxial with the first outlet).

Regarding claims 13 and 14:

Gradon teaches the outer element comprising a swirler space (slots 47 create a swirl – see col 3 lines 17-18) and a tapering area where the bores are located (see Fig 2 – the passage where the bores are located has a tapering passage width – passage at 60 is smaller than at 62).

Regarding claim 15:

Gradon teaches the bores arranged such that a cooling film layer and a fuel do not touch just after entry into the combustion space (see Fig 2; film layer on the outside of the outer element on surface 55 is separate from inner element fuel just after entry into the combustion space).

Regarding claim 16:

Gradon teaches an annular gap that communicates with the bores and wherein there is a swirl (annular gap 46, swirl passages 47).

Regarding claims 19 and 25:

Gradon teaches component feed bores (bores 41) such that the component feed bores communicate with the bores.

Regarding claims 21 and 27:

Gradon teaches the outer element and inner element being coaxial (Fig 2).

Regarding claim 22:

Gradon teaches:

> *An injection element, comprising: an inner element comprising a first outlet opening* (Fig 2; inner element 33, first outlet opening 36)*; an outer element with at least one second outlet opening structured and arranged for receiving and injecting fuel in a combustion space, and arranged coaxially to the first outlet opening* (outer element 56, second outlet opening 40 coaxial with 36)*;*
> *the inner element further comprising third outlet openings composed of bores structured and arranged for forming a cooling liquid film layer, wherein the bores are arranged along a ring, which is coaxial to the first outlet opening and the at least one second outlet opening to surround the first outlet opening* (inner element has third outlet openings 24 which are coaxial with the first outlet and surround the outlet opening)*.*

Regarding claims 33 and 34:

Gradon teaches:

in combination with a combustion chamber, wherein the third outlet openings are structured and arranged for forming the cooling liquid film layer on a wall of the combustion chamber (surface 55 can be considered a "wall of the combustion chamber" since it is inside the combustor; a film of fuel is injected onto the surface – col 3 line 50; when the openings 24 are defined as the third outlet openings, fuel flowing through passage 27 can be considered a "film").

5. Claims 22-25, 27-32 are rejected under 35 U.S.C. 102(b) as being anticipated by US 3,703,259 to Sturgess et al (Sturgess).

Regarding claim 22:

Sturgess teaches:

An injection element, comprising: an inner element comprising a first outlet opening (Fig 7; element 36 with opening 60)*; an outer element with at least one second outlet opening structured and arranged for receiving and injecting fuel in a combustion space, and arranged coaxially to the first outlet opening* (outer element 42 has an annular opening coaxial with element 36 and receives fuel from fuel conduit 58; injects fuel into combustion space 70)*;*

the inner element further comprising third outlet openings composed of bores structured and arranged for forming a cooling liquid film layer, wherein the bores are arranged along a ring, which is coaxial to the first outlet opening and the at least one second outlet opening to surround the first outlet opening (Fig 2; bores

40 on element 36; The bores are arranged around a circumference that is coaxial with the outlet opening).

Regarding claims 23 and 24:

Sturgess teaches the bores being uniformly distributed about an entire circumference of the inner element (see Figs 2 and 1; can also be considered a "portion").

Regarding claim 25:

Sturgess teaches component feed bores (bores for conduit 58) such that the component feed bores communicate with the bores.

Regarding claim 27:

Sturgess teaches the outer element and inner element being coaxial (Fig 7).

Regarding claim 28:

Sturgess teaches:

A method of injecting fuel into a combustion chamber comprising:

guiding fuel into the combustion chamber through a first outlet opening (Fig 2; 60)*;*

guiding fuel into the combustion chamber through a second outlet opening arranged coaxially with the first outlet opening (exit of duct 42)*; and*

forming a cooling liquid film layer in the combustion chamber through bores arranged to coaxially surround the first outlet opening (bores 40 or 80; col 7 lines 1-4).

Regarding claim 29:

Sturgess teaches the film directed toward the inner wall of duct 55.

Regarding claim 30:

Sturgess teaches the bores arranged in a circumference that is coaxial and surrounding the second outlet opening (see Fig 13; bores are in the duct wall 42, which is surrounding the opening of the duct).

Regarding claims 31 and 32:

Sturgess teaches creating the film from bores in the first element (see Fig 2 – bores 40) and also from the bores in the second element (see Fig 7 – bores 80).

6. Claims 12, 22, 25, 27 are rejected under 35 U.S.C. 102(b) as being anticipated by US 6,101,814 (Hoke).

Regarding claim 12:

Hoke teaches:

An injection element, comprising: an inner element with a first outlet opening (Fig 5; inner element 70)*; an outer element* (everything radially outward of the element 70; an "element" can comprise multiple pieces)*, comprising:*
at least one second outlet opening structured and arranged for receiving and injecting fuel in a combustion space, and arranged coaxially to the first outlet opening (second outlet 142; even though Hoke teaches air going through this passage, fuel is capable of flowing through it. In order to define over this, Applicant must define the passage/outlet as being in fluid communication with a fuel)*; and*

third outlet openings radially beyond the at least one second outlet opening composed of bores structured and arranged for forming a cooling liquid film layer, wherein the bores are arranged along a ring, which is coaxial to the first outlet opening and the at least one second outlet opening (third outlet bores 122 are coaxial to the first outlet and second outlet; "for forming a … film layer" does not hold patentable weight without further structure - how the bores are arranged to form the film layer).

Regarding claim 22:

Hoke teaches:

An injection element, comprising: an inner element comprising a first outlet opening (Fig 5; inner element 70, the first outlet is the outlet of element 70 upstream of 78)*; an outer element with at least one second outlet opening structured and arranged for receiving and injecting fuel in a combustion space, and arranged coaxially to the first outlet opening* (second outlet 142; even though Hoke teaches air going through this passage, fuel is capable of flowing through it. In order to define over this, Applicant must define the passage/outlet as being in fluid communication with a fuel)*;*

the inner element further comprising third outlet openings composed of bores structured and arranged for forming a cooling liquid film layer, wherein the bores are arranged along a ring, which is coaxial to the first outlet opening and the at least one second outlet opening to surround the first outlet opening (Fig 5; bores 122 on element 92 – 92 can be considered a part of an "inner element"; The

bores are arranged around a circumference that is coaxial with and surrounds the first outlet opening).

Regarding claim 25, 27:

Hoke teaches component feed bores that communicate with the bores (component feed bores 168 inject a fluid that mix with the fluid from the bores; they mix downstream of the injector). The inner and outer elements are coaxial with each other (see Fig 5).

7. Claims 28-31 are rejected under 35 U.S.C. 102(b) as being anticipated by US 3,866,413 ('413).

Regarding claim 28:

'413 teaches a first outlet opening (opening through element 15, Fig 1), second outlet opening (passage through element 34), and bores coaxially surrounding the first opening (bores 17 surround the element 15). The bores inject fuel onto a prefilming surface 18 (i.e. the create a film layer).

Regarding claim 29:

The surface 18 is considered a combustion space inner wall.

Regarding claim 31:

The fuel source that feeds the first outlet opening also feeds the orifices 17 (source 9).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 17-18 and 23-24 rejected under 35 U.S.C. 103(a) as being unpatentable over US 3,498,059 (Gradon) in view of US 3,703,259 to Sturgess et al (Sturgess)

Regarding claims 17 and 18:

Gradon is silent as to the uniformity of the bores 64. Sturgess teaches the bores distributed uniformly about the circumference of the outer element (see Fig 7; one bore at the top, one at the bottom; can also be considered a "portion"). It would have been obvious to one of ordinary skill in the art at the time of the invention to arrange the bores of Gradon uniformly about the circumference in order to provide uniform flow, as taught by Sturgess.

Regarding claims 23 and 24:

Gradon is silent as to the uniformity of the bores. Sturgess teaches the bores being uniformly distributed about an entire circumference of the inner element (see Figs 2 and 1; can also be considered a "portion"). It would have been obvious to one of ordinary skill in the art at the time of the invention to arrange the bores of Gradon uniformly about the circumference in order to provide uniform flow, as taught by Sturgess.

10. Claims 20 and 26 rejected under 35 U.S.C. 103(a) as being unpatentable over US 3,498,059 (Gradon) in view of US 5,113,647 to Shekleton (Shekleton).

Regarding claims 20 and 26:

Gradon teaches a gas turbine but fails to teach a rocket. However, it was well known in the art to use gas turbines to drive rockets in order to extend the rocket's range, as taught by Shekleton (col 1 lines 27-33). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the gas turbine of Gradon in a rocket in order to extend the range of the rocket, as taught by Shekleton.

11. Claims 23-24 rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,101,814 (Hoke) in view of US 3,703,259 to Sturgess et al (Sturgess)

Regarding claims 23 and 24:

Hoke is silent as to the uniformity of the bores. Sturgess teaches the bores being uniformly distributed about an entire circumference of the inner element (see Figs 2 and 1; can also be considered a "portion"). It would have been obvious to one of ordinary skill in the art at the time of the invention to arrange the bores of Hoke uniformly about the circumference in order to provide uniform flow, as taught by Sturgess.

12. Claims 20 and 26 rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,101,814 (Hoke) in view of US 5,113,647 to Shekleton (Shekleton).

Regarding claims 20 and 26:

Hoke teaches a gas turbine but fails to teach a rocket. However, it was well known in the art to use gas turbines to drive rockets in order to extend the rocket's range, as taught by Shekleton (col 1 lines 27-33). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the gas turbine of Hoke in a rocket in order to extend the range of the rocket, as taught by Shekleton.

13. Claims 20 and 26 rejected under 35 U.S.C. 103(a) as being unpatentable over US 3,703,259 to Sturgess et al (Sturgess) in view of US 5,113,647 to Shekleton (Shekleton).

Regarding claims 20 and 26:

Sturgess teaches a gas turbine but fails to teach a rocket. However, it was well known in the art to use gas turbines to drive rockets in order to extend the rocket's range, as taught by Shekleton (col 1 lines 27-33). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the gas turbine of Sturgess in a rocket in order to extend the range of the rocket, as taught by Shekleton.

Response to Arguments

Applicant's arguments filed 12/9/09 have been fully considered but they are not persuasive.

With regards to Applicant's assertion that Sturgess's third outlet openings 40 do not surround the first outlet opening 60, Examiner disagrees. Applicant asserts that because the openings 40 are axially offset from the opening 60, the term "surrounding"

is not reasonable. Examiner disagrees. When viewed from a downstream point of view, the openings fully enclose the opening 60 in a circumferential manner, thus "surrounding" the opening 60 circumferentially. In order to overcome this, Examiner suggests defining a wall with a face, the first and third openings defined on that face.

Evidence that Examiner's interpretation is acceptable and known in the art is shown in US 6,942,121 (Northup). Northup teaches an annular element that is both axially offset and radially (circumferentially) surrounding an aperture (col 4 lines 29-30). Thus, it was known in the art that an element can surround another even if they are axially offset from one another.

In another possible interpretation of Sturgess, the "first outlet opening" can be simply moved upstream so that it is on the same plane (so that the "opening" is in the middle of the passage), since the claim does not require the opening to be at the terminal end of a passage.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANDREW NGUYEN whose telephone number is (571)270-5063. The examiner can normally be reached on Monday - Friday 8 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Cuff can be reached on (571)-272-6778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/AN/

/Michael Cuff/
Supervisory Patent Examiner, Art Unit 3741